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THE JOURNAL OF PHILOSOPHY

THE SYNTHESIS OF MIND

I. Introspection Versus Behaviorism

THE concepts of *purpose, volition, personality,* and kindred obscure notions are subjects which most teachers of psychology feel called upon to discuss in their classes, but the consideration of which they postpone until the latter part of the course, hoping that all the available time will be consumed before arriving at these insolubilia—a happy consummation of affairs which relieves them of the necessity of taking up these mysteries. The reason underlying this attitude is an interesting comment upon the status of the would-be science of psychology.

Although to-day Miss Mary Whiton Calkins still speaks of "volitional consciousness" as though this arose as the result of the activity of a self which wills the action initiated to bring about the desired ends, most psychologists recognize that the term "volition" or "will" is a heritage of faculty psychology, which, in the sense of representing one of the compartments of the mind, must be abandoned. These same psychologists, accepting the fact of organic evolution, with all the consequences which this entails (such as the relegation of old-fashioned dualism to the status of one of the fossils of cultural evolution) are further prepared to admit that many of the categories current in contemporary psychology, such as *memory, imagination, feeling, etc.,* were coined by creatures of more primitive intellects who constructed theories of human behavior without any knowledge of the biological mechanisms involved in conduct. Yet these same psychologists will not permit the abandoning of this archaic terminology, including the notorious term "*consciousness,*" because, they hold, while these categories may not represent faculties of the mind, nevertheless, they do stand for functions, or modes of behavior, or different kinds of acts. Consciousness, for example, is held by many not to be a thing or entity, as it once was, but, they say, "conscious behavior" refers to some aspect of conduct which is thereby differentiated from other kinds of behavior, such as reflex action. Hence, they argue, let us keep the old terminology, at the same time trying to find the sensori-cerebro-motor correlates for these terms. For this reason they feel that they must discuss the

aspects of what were once the "full-blooded soul"; and thus in most textbooks of even the professed mechanistic psychologists we find reasoning, feeling, volition, and other psychological categories discussed under separate heads, as though they were sufficiently different kinds of human action to warrant individual treatment.

On the other hand, when we get to the so-called "higher mental processes" the physiological bases are so obscure, the experimental results often so conflicting, and, in general, the problems so complex and difficult that many, as previously stated, prefer to discuss the physiology of sense perception to such matters as purpose and volition. Volition involves questions concerning the realization of purposes, foresight of ends, the nebulous notion of "general intelligence," and other intricate phenomena of such an intangible nature as to frighten off all but the most tough-minded. There are ethical considerations which also enter into the fear complex directed against such metaphysical problems—questions involving freedom of the will, hedonism, *etc.*

One might argue that the best way out of this dilemma would be to make a fresh start, following the counsel of one behaviorist, who, in answer to the challenge of an introspectionist to point out the neuro-muscular correlate of the image, replied by exclaiming that "the behaviorist doesn't give a damn about images or consciousness." The implication of this is that it isn't the business of the behaviorist to try to find physiological correlates for an obsolete terminology. The thing to do, this behaviorist advises, is to observe behavior, classify responses into groups, and label them with Greek symbols or names, and then to predict which kind of responses will follow given types of stimuli. So far as consciousness is concerned, the only problem the behaviorist faces is that of describing the situation in which such a combination of words, "I am conscious," happened to arise in the development of speech reactions.

The present writer has no such faith in the efficacy of such a fresh start. His development is arrested by this question: upon what basis shall behavior be thus classified in this new and true psychology? What is the *principium divisionis?* I believe the introspectionist has the better of the argument when he insists that no principle of division has been or can be formulated independent of "subjective" reference. To go back to hypothetical primitive man: how did he arrive at the categories of his early type of psychological explanation? He must have secured his clue from introspective observation of his own responses, feelings, beliefs, *etc.*, which he found to be rather uniformly associated with certain of his own bodily modifications (anger associated with clenched fists, *etc.*), and these subjective findings he must have projected out into his fellow man

to designate similar feelings in those who displayed the same expressions. That the other individual was conscious of the same sort of content which he experienced when he displayed the same sort of behavior was taken for granted. Actually, whether another person's consciousness of content is ever identical with our own is, perhaps, insoluble. This is like asking whether the green you see is like the green I see. Since the assumption that our consciousness of content is the same when we talk to each other about similar experiences has the pragmatic sanction of affording a very workable scheme for the prediction of behavior, the question of whether you mean by your consciousness the same thing that I mean by mine is one which only "a fool or a philosopher," or a psychologist debauched with theories, would think to ask.

Moreover, it is actually upon the basis of introspective findings that the behaviorists have arrived at their own categories. The inability to get away from introspection is seen in John B. Watson, who utilizes a minimum of categories created by introspection, but it is this minimum which makes his system appear anything like what is termed "psychology." Thus, in dealing with emotions, he classifies them into fear, rage, love (sex), and ends his *Psychology from the Standpoint of a Behaviorist* with a chapter on "personality."

Dr. A. P. Weiss[1] attempts to get away from the introspective analysis (although, like Watson, he makes room for it under the "verbal report" method) which yields such categories as memory and imagination by saying that these include an individual-social or biosocial aspect. While this is true, I do not see that this helps us very much. Furthermore, geneticists tell us that special abilities are inherited. Now if the inheritance of so-called "mental traits" follows Mendelian principles (which is not yet conclusively established) then such categories as imagination and volition would seem to be at least as specific forms of behavior as mathematical or musical ability, though perhaps not as simple, genetically, as feeblemindedness. That is to say, the introspectionists have as much right to argue that they have as pure an aspect of conduct in volition or ideation as Dr. Weiss (somewhat after the fashion of Durkheim and Levy-Bruhl) has to assert that these categories have arisen historically out of the fact that social groups have found it convenient to classify certain rather similar modes of response by attaching to them class names which are useful because, statistically, it is found that large numbers of individuals in a group make similar classes of responses to similar classes of stimuli. The plausibility of such a procedure consists in introducing into the term "stimulus" all that

[1] "Behaviorism and Behavior," by A. P. Weiss, *Psychol. Rev.*, Vol. 31. No. 1, pp. 32–50.

was formerly implied in the central (psychic or neural) aspect of "experience." To be sure, such differences as are given by the terms "speech reactions" and "fighting" do not seem to rest upon introspection, but it is doubtful whether they would have any meaning or explanatory value for anyone (except a sophisticated psychologist) who could not identify them by reference to his own experience introspectively studied.

Aside from the fact that behavior can not be studied, classified, and interpreted independently of our own introspective findings, there is the added objection that a psychology which talks in terms of *alpha* reaction and *beta* responses, instead of thinking, feeling, and willing, bears no relation to what is historically known as psychology, and, for various reasons, it is doubtful whether it is advisable to break from traditional psychology in such a fashion. Of course, individual behaviorists differ as to the proper program of their science, and the above remarks hardly apply to Dr. K. S. Lashley's[2] position, though it is doubtful whether his point of view is really "behavioristic" in the original Watsonian sense of the term. In reply to the other type of behaviorism, which disallows any ontological meaning to the term "consciousness," and which holds that the only problem which consciousness of content presents is that of determining the individual-social conditions for the stringing together of the words to produce the sentence, "I am conscious," or "I have an image," or what-not, it may consistently be argued that this reduces, in the end, to the finding of the physiological correlates for the terms "images," "concepts," "feelings," "volitions," and the like. In other words, speech reactions do not arise out of disembodied social groups, but originate in individuals in response to stimuli, and the problem of explaining how some one in the remote past once happened to say "I am a conscious being" is nothing more or less than the problem of determining the actual bodily conditions which were active when these words were uttered.

The very fact that these concepts have become conventionalized and passed on through social inheritance demonstrates that they symbolize some rather uniform sensori-cerebro-motor conditions which were common to all the members of the group in which this primitive philosopher delivered himself. It is true that many words exist today for which no corresponding realities can be found, but contemporary psychologists are not arguing (in so far as they are monists) that these terms, sensations, images, and affections symbolize unverifiable entities, but are names for certain forms of action which may thus be differentiated from each other. The presumption seems to be in favor of the existence of consciousness in some sense.

[2] "The Behavioristic Interpretation of Consciousness," by K. S. Lashley, *Psychol. Rev.*, Vol. 30, pp. 237–272.

I shall, therefore, assume that the real business of the theoretical psychologist consists in finding the physiological correlates for the present categories of psychology, granting at the same time that the meaning of these categories or the categories themselves may have to be modified from time to time.

II. Centralism Versus Peripheralism in Psychology

Vague as most of the generalizations in psychology are at the present time, there is sufficient agreement to permit us to accept as a fact the view that the mechanisms of thought and conduct are organized in a hierarchy of levels, and that the unified character of what is termed purposive, volitional action is dependent upon the facilitations and inhibitions which higher arcs exercise upon those of lower strata. Thus we may suppose that ideo-motor action (in a neurological sense) is superimposed upon sensori-motor arcs to produce conscious, adaptive responses. In this fashion, through what is termed the integrative action of the nervous system, unity of direction of behavior is introduced into what would otherwise become a chaos of uncoördinated responses.

Simplifying our problem as much as possible by leaving out of account the question of the hypothetical existence and influence of a non-physiological entity, mind (mind is an inference from consciousness of content, which is a datum), as a causal agency which acts as a kind of switchman standing at the synapses to redirect the neural flux by shunting impulses over the various appropriate tracks (nerve fibers), we still find that we have a number of problems on our hands awaiting solution, which may be formulated as follows:

1. What evidence is there, on the anatomical side, for the existence of this hierarchy of reaction levels, which seems to obtain on the functional side?

2. To what extent may the brain function independently of the sensory and motor segments of the physiological mechanism?

3. Of what significance is the matter of the transfer of functions, which have hitherto been held to be rather definitely localized in the various areas of the cortex? That this transfer may readily take place is demonstrated by K. S. Lashley [3] in his studies of the cerebral function in learning, especially his recent work in the extirpation of cortical tissue in apes. The fact that other parts of the brain, presumably not formerly concerned in a given kind of behavior, can, in time, take over the functions supposedly once localized in a now permanently destroyed part of the brain (such cases have been studied by Dr. Henry Head) has sometimes been held to prove that the brain is only (to borrow an analogy from Driesch) like a piano,

[3] *Psychobiology*, Vol. II (1920), pp. 55–135.

a keyboard played upon by the mind. Bergson's argument in *Matter and Memory* takes this form.

But it may be argued by mechanists that a pressure from the sensory side or a suction from the motor side forces a recovery of function in the central coördinating center by opening up new brain paths to take the place of the engrams erased in the injured tissue. It may further be argued that the doctrine of localization of function is a survival, a false notion, passed on from phrenology. If we assume, with Max Meyer ("The Fundamental Laws of Human Behavior"), that every receptor is more or less directly connected with every effector, and, as Lashley's experiments seem to prove, that any neurone can take over the function exercised by any other neurone, the above explanation becomes quite tenable.

4. What part does short-circuiting play in thought, and what is the mechanism of its operation? We certainly are constantly leaving out the premises, conclusions, or intermediate steps in our reasoning processes, and it is natural to suppose that these short-cuts must have some correlate on the anatomical side. It is believed by some that once a thing has been learned at a higher level involving consciousness that later on this response may drop down to a lower level where it is performed unconsciously. Thus it has been suggested that the serial motor responses (dancing, for instance) originally functioning at a cortical level may later drop down to the cerebellar level. This is an alternative to a cortical-synaptical theory of the unconscious performance of habitual action.

5. What is the rôle of substitution in response, and what is its mode of operation? That this substitution takes place must follow in a behavioristic scheme which reduces all mental processes to effector activity. As a refutation of the behavioristic contention that actual movement or innervation of the muscles of the speech organs is necessary to verbal thinking, McDougall in his *Outline of Psychology* (page 298) cites the experiment in which one may inwardly repeat a train of verbal thought, while rapidly repeating aloud the alphabet or counting. This objection can be taken care of if it can be shown that some or any other sets of muscles can take over activities originally restricted to the speech mechanism, thus acting as substitute stimuli or substitute responses or both.

These above questions constitute the problems with which modern theoretical psychology must concern itself in trying to weigh the merits of the problem of centralism *versus* peripheralism. I have no intention of attempting to solve these problems; my only aim is to show that a definite formulation of the problems is the prelude to an experimental attack which may some day result in a solution. I do not propose to discuss any further items 3, 4, and 5, except as

they may overlap 1 and 2, to which I would like to return to develop in more detail their interesting features.

That the nervous system is organized in a hierarchy of levels which represent the synthesis of reactions phylogenetically and ontogenetically acquired in an evolutionary order is not disputed on a gross scale. The evidence for this rests upon a few facts of elementary neurology. It is known that the older and more stable reactions are coördinated on the lower (posterior) levels of the nervous system, and that the nearer one approaches the cerebrum the more recent, less mechanized, and more easily broken down these reactions become. Fatigue, narcosis, toxic conditions, and dementia attack these less firmly established neurograms first. Evolution has taken the direction of increasing cephalization. For this reason the spinal level is more primitive than the cerebellar level; and the occipital cortex is a higher level of coördination than the thalamus. We may also suppose that the medulla automatically functions in the partial control of breathing and beating of the heart because it is a reflex center over which voluntary action and cerebral behavior have but little influence.

However, the existence of such a hierarchy within the cerebrum itself is not so obvious. On the functional side such a stratification is presupposed in the distinction between higher mental processes and the more elementary ones. Thus a percept is usually defined as a unified group of sensations; and ideas are regarded as unified groups of images. From this point of view we might call sensations *first order objects,* and percepts *second order objects,* and concepts *third order objects,* and from these derive logical propositions and inferences. This is what is meant by the synthetic activity of mind. The difficulty with this synthesis of what Meinong calls "objects of a higher order" is that there is evidence that perception and conception are not two distinct forms of activity, but that there is a conceptual element in perception in the form of implicit judgments or inferences, which really constitute the meaning of the percept. This, at least, is the position maintained by Stout.[4] But on the anatomical side the existence of such a stratification is a matter of dispute. The customary localization of the sensory areas in the post-Rolandic zone and the motor cortex in the precentral gyrus suggests that motor coördination represents a higher functional unit than does sensory analysis,—a generalization which secures added confirmation if it be granted that the frontal lobes constitute the supermotor areas for skilled movements. Intelligence, and even moral conduct, has been localized in the frontal lobes, probably because these involve the greatest amount of integration, and of association of "col-

[4] *Analytic Psychology,* Vol. 2, p. 173.

lateral ideas'' and inhibitory processes. (This suggests the interesting question of whether or not ''morality'' can be distinguished from ''intelligence,'' which can not here be considered.) Several neurologists have been led to the conclusion that there is a functional difference between the different layers of the neurones of the cortex, the infragranular (lower) being thought to be concerned in sensori-motor reactions, while the supragranular layers serve the higher associations manifested in intellectual life.[5]

In so far as we can draw any inferences at all, from the evidence on both sides, I think we may certainly conclude that there is relative localization of function in the sense that if we assume that the various functions designated by ''perception,'' ''ideation,'' ''volition,'' and so on, do represent roughly delimitable types of action, and that if one such function has its seat in one area of the cortex, then the other can not be resident in the same area at that same time. We may further conclude that in embryological and post-natal development certain areas are more favorable to the taking over of certain of these forms of behavior than are others. These conclusions may be held to be supported by the absence of frontal lobe development in microcephalic idiots, the clinical observation of the association of mental defects with definite cerebral lesions or degenerations, and the developmental sequence of the medullary sheath, the child at birth being limited almost entirely to motor activity because, if Flechsig's hypothesis has any value, the sensory area neurones are medullated early, while the association area neurones do not get their sheaths until later.

Starting with the brain as a complex system of potential reaction patterns, with various areas favorable to the taking over of certain functions, made possible by the existence of inter-neuronic resistence gradients, we may view the cerebrum as an organ engaged in the process of building up levels of synthesis as adaptive responses emerging through the process of interpreting stimuli from the external world. These stimuli are signs or signals to which the brain must find the code and give the reply. The ability to readjust one's motor coördinations to changed sensory conditions, such as are presented in mirror writing or the wearing of spectacles, which reverse the ordinary spatial orientation of objects, supports this theory of the interpretive action of the brain. Our ''meanings'' are thus largely the products of habits and conditioned reflexes. As a compromise between the nativistic and empiristic theories of perception we may view this capacity for building up a meaningful and unified universe through integration and interpretation as innate, though the actual content which enters into perceptual-conceptual coördina-

[5] *An Introduction to Neurology*, by C. J. Herrick, 1916, Ch. XX.

tion is acquired. How this potential capacity can be carried is nothing more or less than the problem of how instincts which mature later on in development, or inherited mental traits still latent, can be born along in a nascent condition in an evolving organism—a question to which I have no answer.

Turning now to the second question, we find that it seems to be the bone of contention between those, on the one hand, who hold that centrally aroused processes (*images*) may continue functioning without continuous sensory stimulation, or without sufficient overflow into the musculature to afford any basis for the belief that the observation of behavior will enable one to predict what is going on in the central mechanism, and those, on the other hand, who believe that implicit muscular activity is present in all thought and conduct.

Historically, the abandoning of the notion of the sense of effort as the feeling of the self-activity of the ego is the forerunner of all ultra-modern theories of kinæsthesis as an explanation of perception, meaning, belief, and volition. In this respect William James's presentation of the content of emotion as determined by proprioceptive and interoceptive stimuli reflected back into the central mechanism is the prototype of all behaviorisms. Knight Dunlap's [6] attempt to reduce habits of thought and action to serial responses in which the associations are conditioned by previous habits (what he calls "homœdetic arcs") is only an extension and pictorial presentation of the peripheral theory of emotion.

The behaviorist is likely to argue that this question of the relative independence of the brain of the sensory and motor sides is only a hang-over from the old superstition that the laws of neural conductance were different for the central factor than for the peripheral sides. This is the position taken by Dr. H. M. Johnson [7] ("a methodological behaviorist") who, in support of the doctrine that perception consists in finding appropriate responses to stimuli, insists that the "attentional" and "volitional" factors can not be isolated from the sensory ones. He argues that the partial and complete muscular contractions which excite the muscle spindles imbedded among the muscle cells, which initiate the circular arcs (originating and terminating within given muscles) are important factors in all activities. "There is not the slightest evidence that the process of 'becoming aware of' the object which is 'discriminated' precedes the differential response of the muscles; ...." This conclusion Dr.

[6] "The Biological Basis of the Association of Ideas and the Development of Perception," by Knight Dunlap, *Psychobiology*, Vol. II, pp. 29–53.

[7] "Speed, Accuracy and Constancy of Response to Visual Stimuli as Related to the Distribution of Brightness over the Visual Field," by H. M. Johnson, *Journ. of Exp. Psychol.*, Vol. VII, No. 1, p. 13.

Johnson [8] believes is supported by the dynamogenic influence which light has upon tactile discrimination. However, as we will see in a moment, psychologists of recognized standing still maintain the position that muscles and glands play an insignificant rôle in perception and conception.

Franz Brentano has earlier insisted that one can apprehend the meaning of a proposition without taking any behavior attitude towards the content of the believed proposition. William McDougall [9] has argued that the intention underlying an act must be psychologically distinguished from the act itself, just as it is so distinguished legally. This "independent variability" of cognition and conation, of belief and purpose, of intention and act, might seem to undermine any behavioristic view of thought. Both McDougall and Miss Calkins protest vigorously against the setting up of kinæsthesis as a fetish. That their objections are not unassailable other critics have shown.[10]

This hiatus between the "centralist" and the "peripheralist" may, I believe, be bridged over by the formation of certain principles of response which may be set forth in the following fashion:

1. Neural impulses are pulsatory in character. Following the transmission of a nervous excitation there is a "refractory period" of about .0025 of a second, during which the nerve can not transmit another wave of ionization.

2. The strength of each impulse is independent of the strength of the stimulus. This is a reformulation of the "all or none" principle applied to nervous processes, which seems to have been established by Adrian and Lucas in their work on the conduction of nervous impulses.

3. If the amount of energy delivered by each neurone is a maximum it follows that the only way for nerve flux to be graded is either, (*a*) through the number of neurones active at one time, or (*b*) through the frequency with which one neurone responds in a unit interval of time.

4. In the gradation of responses there are at least four steps. The nerve flux may be sufficient to set up (*a*) a chemical change without any contraction in any of the cells of a muscle, (*b*) activity may be initiated in a muscle or muscles, but the number of muscle cells innervated is not great enough to overcome the inertia and the antagonism of other opposing muscles, and this results in "muscle tonus," (*c*) movements of small extent for a brief period, such as

[8] *Pyschobiology*, Vol. II, pp. 351–373.

[9] *Psychol. Rev.*, July, 1923.

[10] See Miss M. F. Washburn's review of McDougall's *Outline of Psychology* in the *Philosophical Review*, Vol. XXXIII, p. 87.

gesture, (*d*) ordinarily grossly observable movements. (I am indebted to Dr. H. M. Johnson for this way of stating the gradations of muscle response.)

If these principles are correct several inferences may be drawn. First, on the sensory side, the pulsatory character of nerve current transmission may provide the basis for the content of introspection, usually designated as "qualities." This *neural periodicity* theory is the substitute which E. B. Holt[11] proposes for the theory of the specific energies of the nervous system. The fact, which Holt does not cite, that the same afferent bipolar neurone may respond to two different types of stimuli (acid and alkali, for instance, in the case of the taste-bud receptors) puts an end to all theories of the specificity of nervous function. Of course, in the case of vision, the difficulties arise in trying to derive *hue, tint,* and *chromo* from a frequency basis.

Aside from cortical-synaptical theories of the origin of qualities, the only theory which presents a possible explanation is set forth by L. T. Trowland.[12] The problem is to show how qualitative series as well as quantitative gradations can be transmitted by the same nerve fibre. Some experiments seem to indicate that we must reject the idea that the *intensity* of visual sensation depends on the number of sensory fibres excited. Now if we correlate the frequency of the nerve impulse (*i.e.,* the total number of quantal or "all or none" pulses passing through a unit cross-section of any fibre per unit time) with the intensity of visual sensations, the qualitative aspect must depend upon something else. Trowland's suggestion (it is hardly anything more than a suggestion) is that the qualitative aspect may be represented by some sort of "group frequency." Thus, to expand the suggestion, we may have 6 neural impulses sent over the same afferent neurone within a unit of time, which would give one frequency, but the different possible groupings within the frequency (2 groups of 3 units; 3 groups of 2 units; 6 units equally spaced, *etc.*) might account for the qualitative differences transmitted over the same nerve elements. Whether such a theory provides an adequate explanation of the problem of sensory content, and holds out a hope for the reduction of qualitative magnitudes to quantitative magnitudes remains to be seen. The existence of about eighty theories of color vision testifies to the fascination and difficulty of the subject, and the introduction of the quantum theory of energy and photo-electronic phenomena may either complicate or ultimately simplify the situation—it is impossible to say which at the

[11] "The Place of Illusory Experience in a Realistic World," by E. B. Holt, *New Realism,* pp. 303–373.

[12] "The 'All or None Law' in Visual Response," by L. T. Trowland, *Jour. of the Optical Society of America,* Vol. IV, No. 3, pp. 160–186.

present time. The rôle which central fusion and synæsthesia play in perception suggests that qualities may be more than additive properties, the sums of the constitutent elements, a doctrine insisted upon in the theory of *gestaltsqualitäten* of German psychology, especially in the meaning assigned to the doctrine of *form-qualities* as originally stated by Ehrenfels and Meinong.

Secondly, on the motor side, we find this gradation of response provides the basis for the distinction between such acts as judging, believing, wishing, and willing, in so far as these rest upon a reaction basis. That is to say, desire may be regarded as a "degraded" form of response, in which the opposition between antagonistic sets of muscles is not overcome. This view is clearly set forth in E. B. Holt's definition of the "Freudian wish" (in the book by that title, page 56) as "a course of action which the living body executes or is prepared to execute with regard to some object or some fact of the environment." This "set" of an organism may exhibit itself in overcompensation in conduct, slips of the tongue, or wit. From this point of view there is no difference between thought and will, except in the amount of energy involved. Dr. K. S. Lashley[13] has attempted to give a more precise neurological basis for the mechanisms involved in "set," *Aufgabe, etc.*

If we link up Holt's view with the conception of circular responses we arrive at the only conception of "dammed up energy" which is in accordance with present fashions in neurology. It also helps us to understand the matter of dissociation of personality when conceived of as failure to integrate conflicting "wishes," and also demonstrates how it is possible for a person "sicklied o'er with the pale caste of thought" to use up more energy in trying to decide whether or not to do a certain thing than the actual performance of the act itself would require. The condition known as "aboulia" (paralysis of the will) may be nothing more than the continuance of circular responses within antagonistic sets of muscles.

III

Summarizing our results so far we arrive at the following conclusions: in opposition to the type of behaviorism which deals with thinking, feeling, and willing as convenient social classifications, we have arrived at the conviction that the contemporary categories of introspective psychology represent relatively isolatable aspects of human conduct which have their individual character because they symbolize rather uniformly distinguishable receptor-conductor-effector patterns. Contrary to the inferences which might be drawn

[13] "The Neural Mechanisms of Voluntary Movement," by K. S. Lashley, *Psychol. Bull.*, Vol. 21, No. 2, pp. 94–95.

from experiments on transfer of function, we have concluded that the categories "perception," "conception," "feeling," "volition," *etc.*, have rather definite sensory-neuro-muscular-glandular conditions, and that these configurations of thought and conduct are organized in an anatomical-functional hierarchy of reaction levels. These conclusions are supported by evidence from genetics, indicating that "mental traits" are inherited, and the only escape from this logic lies in arguing the very doubtful idea that *genes* and their behavior equivalences, like some of the atomic numbers of the more complex elements of the atomic table, represents only the "central tendency" of a statistical grouping of physical and biological isotopes. If these conclusions are correct it becomes the business of contemporary theoretical psychology to attempt to determine the physiological correlates of such categories.

As a possible solution to the antithesis of peripheralism *versus* centralism I suggest, not that the brain can function entirely independently of the receptor and effector systems, but that it adds a certain qualitative ingredient which is, at the same time, a synergic integration of the sensory and motor components, and a synthesis which presents an element of qualitative novelty which is designated as the conscious side of the pattern. Even admitting that the muscular system phylogenetically represents a more primitive differentiation than nervous tissue, and that in us, the lords of creation, thought involves incipient movement, unless we grant that the cerebrum is a privileged frame of reference, I do not see how we can account neurologically for the fact of introspection or the appearance of sensory and imaginal content, which constitute the ingredients of conscious conduct.

The whole peripheral somatic apparatus seems to constitute a resonator for the brain, and consciousness seems to arise as a kind of dynamic equilibrium of shifting neural tensions. Attention and awareness are proportional to brain activity because consciousness is the complex integration of sensory waves of excitation irradiating over extensive regions of the cortex into motor channels, subsequently reverberating back as summations of interoceptive and proprioceptive stimuli acting into other interfluent discharges. From this point of view the unity of the mind is the unity of the body, or, as Aristotle puts it, the mind is the *form* of the body. Purposive activity is, therefore, the echo in the organism of this universal biological demand for unity of action and integrated behavior.

If it be true, as Wundt insisted when dealing with the perception of space as a *creative synthesis*, that wholes are something more than the additive summation of the constituent elements, then the relation between consciousness and the central nervous system (no

consciousness attends the functioning of the vegetative processes controlled by the autonomic nervous system) is an insoluble problem, and the best we can do is to reiterate with S. Alexander that consciousness is an "emergent quality," or with C. Lloyd Morgan that it is a "new order of relatedness," or with William James that consciousness is a "superadded biological perfection." This may seem like sheer mysticism, but the phenomenon is no less and no more remarkable than the transformation of one form of physical energy into another.[14]

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BOOK REVIEWS

The Nature of "Intelligence" and the Principles of Cognition. C. SPEARMAN. London: Macmillan and Co. 1923. viii + 358 pp.

Without doubt this book is one of the most remarkable attempts in recent times to search critically into the present status of psychology for the purpose of ascertaining the validity of its principles and of presenting a set of fundamental laws which will enable it to take its place "along with the other solidly founded sciences, even physics itself."[1]

Taking his cue from his own statistical work and from unpublished researches on the qualitative aspects of intelligence, Spearman sets out, in his introductory chapter, to review the history of theories of intelligence. He finds the fallacy of "formal power" (faculty) lurking in the original attempts of Ebbinghaus to formulate a concept of intelligence as "combination"; he discovers that the assertions of Binet and his followers imply the theory of "two factors"; he classified the biological definitions of intelligence in terms of adaptation as increasingly vague, and scouts other definitions, generally, as unsuccessful attempts to avoid the old formal notion of faculties. Assuming to have avoided this dilemma himself, he reiterates his interpretation of "*g*" as an energy which serves in common the whole cortex and "*s*" as the functioning of particular groups of neurons into which the common supply of "energy" can be alternatively distributed. As an added safeguard he emphasizes the purely quantitative nature of "*g*." From a qualitative standpoint the solution of the problem of intelligence lies in a psychology of cognition.

[14] The present essay constitutes a chapter of a forthcoming book entitled *Space-Time-Matter.*

[1] Quotation from page 355.

Works in general psychology are quite as confused as the literature on intelligence. We have been using words as if they were algebraic symbols capable of being invented with any significance at will. Moreover, there has been a dearth of adequate ideas and of efficient experimental investigation. For example, the concept of attention, introduced into psychology two thousand years ago, has hardly been improved throughout the history of psychology. Apparent advances have turned out to be fictitious. As time goes on genuine psychological explanations are more and more frequently shirked and in their places are offered "glib references" to "situations," "environment," and responses. We are making the mistake of trying to explain mind by the necessities of living. Instead, we should derive the capacity to live from the nature of mind and thereupon ascertain its nature independently of environment. Brave attempts have been made in the past to save psychology. Hartley with his associationism was an example. Spencer and Herbart were others. But all of these attempts failed.

The future is not necessarily dark, however. To commence our solution of the great problem of making psychology scientific we should bear in mind three ideals: (1) clear thinking, about which we can learn much from the Scholastics; (2) the demand for ultimate laws (here we should avoid bioteleological speculations); (3) the perfection of experimental procedure.

With this long preamble of thirty-five pages the author turns to a consideration of certain postulates upon which to construct a genuine science of psychology.[2] There are three primitive, existential characters (contents) of mind. The first is sensation, an item of "sentience" rather than of consciousness and one which does not bring us to the domain of cognition. It supplies a basis from which the process of knowing can be immediately derived. Knowledge of sensation is obtained by experiment and by inference. As soon as sensory states appear "accessible to knowing," they possess the four "characters" of quality, intensity, spatiality, and temporality.

The second is hedonic affection, (sensation could be given the name, "affection," according to the author), a state not derived from sensory stimulation, but of a "more central origin." Third, there is a group of experienced "characters" to which the name "conation" may be given. This includes all phenomena of appetition or aversion, impulses, desires or acts of will, consent, satisfaction, disappointment, and the like. With Ach, it is assumed that the act of willing is a specific psychic experience.

Given these existential characters we find a set of active prin-

[2] The preamble constitutes part I, entitled "Historical and Critical." Part II begins at this point.

ciples operating from them. The first of these is the principle that "any lived experience tends to evoke immediately a knowing of its character and experiencer."[3] The experiencer is the ego. The ego is known by direct apprehension in experience. Any psychology of cognition which fails to account for this universal apprehending of an ego must be disfigured so widely and deeply as to render it impotent to explain thoroughly the simplest event either in ordinary life or experimental procedure.[4] Those experimental findings which oppose this view are lacking in scientific validity and are products of erroneous *a priori* biases. As a result of this first principle, then, sensations, affections, conations, and the ego become known. To this list we should add all cognitive states which, themselves, may be cognized.

The principle of "lived states becoming known" assumes a variety of forms. The first is propositional import—an end-state of the process of knowing and exemplified in the statement, "I am cold," or, "I want something." The second is belief, *i.e.*, the acceptance of the experienced state as true. The third is coherence, a sort of apprehension of relations between the constituents of the experienced state. The process of knowing is also characterized by the tendency to apprehend experience in unit-processes. These unit-processes may evidently be complex. At least they are dynamic and possess powers of independent growth.

The second main principle is stated as follows: "The mentally presenting of any two or more characters (simple or complex) tends to evoke immediately a knowing of a relation between them."[5] This principle is called the education of relations. Items which are thus apprehended in their relations to one another are called "fundaments." A relation is defined as any "attribute which mediates between two or more fundaments." There are real and ideal relations. To the former class belong attribution (example: the relation of redness to the thing which is red), identity (a physical body is taken to be the same when its position is moved), time relations, space relations, cause, objectivity, and the constitutive relations (several items constitutive of the same complex). To the ideal class belong likeness (in meaning), evidence (of evidence, not *by* evidence), conjunction, and intermixture. These are features universal to all education. The more special varieties of relation-educing are perception and thought under which latter are to be included what we ordinarily mean by judgment and volition.

The third principle follows from the second and is the eduction

[3] Page 48.
[4] Page 54.
[5] Page 63.

of correlates. "The presenting of any character together with any relation tends to evoke immediately a knowing of the correlative character."[6] When one is asked to think of the opposite of good he arrives at an answer by educing a correlate. "Good" is a fundament, "opposite" is the relation and "bad" is the correlate educed. In a general way these three principles constitute the dynamic aspect of the process of knowing.

Spearman then passes on to a second class of principles of a different kind, namely, the quantitative, of which there are five: mental energy (every mind tends to keep its total simultaneous cognitive output constant in quantity, however varying in quality),[7] retentivity, fatigue, cognitive control (the intensity of cognition can be controlled by conation), and primordial potencies (every manifestation of the preceding four principles is superposed upon, as its ultimate basis, certain primordial but variable individual potencies).[8] These quantitative principles engender certain processes of their own, namely, reproduction, disparition, and clearness variation.[9] The latter are given the name " anœgenetic." The reproduction of associates is sharply differentiated by the author from the eduction of correlates. The first is limited by experience; the second is free from any such restriction. For example, the recall of a particular green is limited to a particular experience, but relations of chroma, saturation, and brightness (to other greens) are educed and are not a matter of primary experience. Moreover, there is introspective evidence that the eduction of correlates is something more than the reproduction of associates. Certain experiences reveal the appearance of an *aura* emanating from them as in the case of the *Bewusstheit* of meaning. Again, the appearance of a meaning may anticipate the appearance of a reproduced associate in which case the former is a sort of "prodrone." For example, in trying to think of the opposite of "clumsy" the meaning begins to dawn before it becomes explicit in an idea or in a word.

Approaching the problem from a discussion of clearness and of the lower limen of intensity the author proposes the view that there is a realm of mind not open to introspection, but nevertheless mental, which may be called the "subconscious." It is a realm of mental processes whose cognitive intensity is too low to admit of introspective awareness, but whose intrinsic determinateness makes pos-

[6] Page 91.

[7] Page 191.

[8] The first and fifth quantitative principles are obvious restatements of " *g* " and " *s*." (R. H. W.)

[9] Or, in more conventional language, recall, dissociation, and variations in attention.

sible the principle of eduction. Cognitive intensity, together with determinateness, constitutes "clearness." The former is supposed to depend upon cortical "tension" and the latter upon cortical "configuration."

There follows a lengthy criticism of those views which hold that thought is dependent upon sentience. Those who are opposed to imageless thought are subjected to a caustic invective. We are told that the attempt to reduce meanings to sensation and image leads us into logical inconsistencies. To think only in terms of imagery implies that no person can ever possibly think of anything except his own momentary mental states; he can not so much as suspect that he has undergone any mental state before or that he may do so in the future. We are told that the theory of substitution, so-called, is everywhere contradicted by introspection; that it is absurd because images vary when meanings do not; that the image is frequently discrepant from the meaning; and finally, that the co-existence of image and meaning is no proof of the dependence of the second upon the first. We are even reminded—as we have been many times before—that images are practically worthless lumber. Of apparent importance to the author is Reed's conclusion [10] that inner speech had no important functions in comprehension during reading and writing. As if to impress the reader with a final and impressive thrust at the so-called sensationalist we are presented with a chapter entitled "A Great Illusion." [11] Experiments in perception, reasoning, and thinking clearly indicate that the sentient and imageless elements of consciousness are easily confused by the introspector. We are thereupon told that the works of the imageless-thought school, notably among which are those of Aveling and Moore, have gone the farthest in clarifying the issue.

Experiments in the author's laboratory on perception and affection, from which introspections are profusely quoted, indicate that there is an indescribable manner in which mental states are apprehended. A cognitive act may apparently fall below the threshold of awareness. There may be, however, a remembrance that a state did exist, but was not cognized at the time. Indeed, it looks as if even the simplest forms of cognitive experience amenable to introspection slip down into the realm of the "subconscious" without changing in character. This leaves the problem: How do we cognize—what is the *modus operandi* of cognition—unsolvable!

The author now devotes several chapters [12] to an application of the principles laid down in the first two parts of the volume. He

[10] *Jour. of Exper. Psychol.*, Vol. 1, 1916.
[11] Chapter 13.
[12] Part III.

begins with a psychology of perception. Perception is derived from sensation (sentience), first, by means of an apprehension of the sentient state—a process of differentiation and synthesis—second, by an eduction of relations, and third, by supplementation, with or without the use of imagery. Supplements, regarded from the standpoint of " form," fall into two classes: the reproduction of relations and the eduction of correlates. Regarded from the standpoint of "material" or content this supplementation also falls into two classes, the one sensory and the other non-sensory or " metaphysical." Such is the psychology of the simpler perceptions. In reality the eduction of relations and the evocation of associates and correlates become extremely complex and involve such factors as anticipation and confusion.

Passing now to conception, a concept is defined as any item of cognitive content that, by verbalization, has become comparatively stable.[13] There are three types. Each develops in a certain way from perception. One of these types is largely a product of disintegration, another is a product of confusion, and a third is a product of free eduction. It is impossible to limit concepts, in a broad sense of the term, to ideational forms of awareness. There are other varieties not constituted of imagery and word symbols. These are given the class name of "fluid awareness" or "sciousness"—out and out imageless and non-sensory thoughts. Indeed, we are told that the bulk of the cognitive field is "fluid," with or without sensory supplements, and dotted only here and there with verbo-conceptual "rigidity." In no way, then, can we speak of concepts as composite, fixed, or discrete.

In the subsequent chapters on judgment and reasoning, judgment is conceived as a particular case of educing relations. It is based on conception. Some judgments partake more of an intellectual character than others. The former consist of the educing of relations between concepts. The simpler forms of judgment involve educing relations when one fundament is a concept and the other is a percept. Since there are "fluid" fundaments, the process of educing relations between them may also be called the process of judging. Further, there is a process of correlate eduction on the level of judgment as there is on the level of perceiving. Reasoning amounts to an educing of relations between propositions, a form of syllogistic deduction.

In his treatment of memory and imagination the author finds that the principles already set forth are adequate for all descriptive and interpretive purposes.

In summary, then, the criterion of "intellect" is its imperceptive

[13] Page 266.

tuality, its dynamic, generative property called nœgenesis, whose three principles of operation are apprehension, eduction of relations, and the eduction of correlates. These three principles possess certain properties in common: they assume the form of self-evident propositions, they generate items of cognitive content, and the resulting growth of mental content proceeds along two simultaneous lines—intensity and determinateness. This growth advances a step on the occasion of every single experience, not only in the life of the individual but of the race.[14]

To judge the merits of such a book as this is exceedingly difficult for one whose point of view differs so widely from the author's. Nevertheless, there are several good and several questionable features of the above system upon which the majority of psychologists would doubtless agree. In certain respects the author's analyses and interpretations are of far-reaching importance. His system, if it can be called a system, breaks away, on the whole, from the structural-sensationistic point of view. His psychology is based on functions and not contents. The latter are regarded only as means to a end. It is a relief to find a treatise which boldly breaks away from the double-aspect theory and is genuinely monistic. It finds a place for the so-called "subconscious realm" and makes it not an unconscious consciousness but a non-reflective consciousness to which the name "sentience" is given and which differs from reflective consciousness in the degree to which recognition is involved. It elevates the problem of "meaning" to its obvious place of utmost importance in psychology. It regards "clearness" as a problem in meaning and not a problem in attention, *per se*, and this to the reviewer, at least, is an excellent point. And finally, it realizes that processes of differentiation and synthesis go hand in hand from the beginning of mental growth in the individual. The elaborate attempt to solve the problem of meaning, experimentally, has opened up a wide variety of difficulties the solution of which will not be easy. At first thought one is left with the impression that the problem of meaning is after all unsolvable, for simpler and simpler forms of meaning apparently simmer down to nothingness—approaching the level of "sentience" without losing their distinguishing characteristics.

But, unfortunately, we are forced to enumerate a much longer list of questionable features. The book might just as well have been written by a Scholastic of the Middle Ages. Its treatment of mental life is logical and philosophical rather than descriptive and psychological. Masses of scientific literature are either overlooked or con-

[14] Page 344.

demned on the same *a priori* grounds which the author attempted to avoid, and, with a characteristic logical and "*Kundgabe*" bias, he accepts as final the works of Ach on will, Aveling on abstraction, and Moore on meaning, all of whose results have given way to investigations of a more careful and analytical nature. Indeed, his attachment for imageless, though fluid, contents, conation as an element of consciousness and the like, places him definitely in the historic Würtzburg period. Nor does his adherence to that mysterious psychic "entity," the ego, lend scientific merit to his system.

The book abounds with a helpless and tangled maze of logical fictions which becloud rather than clarify psychological issues. Most psychologists have long since abandoned attempts to construct a descriptive science on arm-chair deductions. We can entertain little hope that the author will succeed in putting psychology upon its feet by the introduction of such concepts as the eduction of relations, correlates, propositions, the ego, the ego's apprehending of itself, aura, fundaments, fluid contents, metaphysical supplements, and "confusions." Neither the bulk of these ideas nor the language in which they are expressed is suitable for a descriptive science.

And finally, the author's experiments on perception and feeling yielded introspective results of so meager a quality and so lacking in detail that the results can hardly be regarded as trustworthy. The introspective technique is open to the same serious objections as that of the earlier members of the Würtzburg School. The psychological world can not subscribe to the author's conclusions, therefore, that any light has been thrown upon the "most primitive nature of sensory cognition."

In brief, then, the reviewer regards *The Nature of Intelligence and the Principles of Cognition* as an unsuccessful attempt at writing a psychological system. On the other hand, the book contains much that is of great psychological value. If the author has failed on the descriptive side, he has succeeded in bringing to light many problems which can be solved only from a functional point of view. Perhaps foremost among Spearman's contributions in this treatise is the definite challenge: Must psychology admit the existence of a fundamental principle, cognition, on a par with association, attention, and memory, dynamic and creative in nature, or, can this principle be reduced to the mechanism of motor response? [15]

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[15] See Wheeler, R. H., "The Development of Meaning," *Amer. Jour. of Psychol.*, Vol. 33, 1922, 223–233.

La Légende Socratique et les Sources de Platon. EUGÈNE DUPRÉEL. New York: Oxford University Press, American Branch. 1922. Pp. 450.

This book by a professor at the University of Brussels marks a significant and welcome departure from the fashion in Platonic criticism. In the Avant-Propos complaint is made of those historians of philosophy and literature who have presented Socrates as the great master of Plato and inspiration of his thinking. While M. Dupréel acknowledges the debt we owe the erudite works of such men as Grote, Zeller, and Gomperz, he believes that all these writers have misrepresented the facts in this matter. A quotation from Cicero best serves to express the traditional view to which M. Dupréel takes exception. "Ses diverses méthodes de raisonnement, la variété des choses qu'il a traitées, et l'étendue de son génie, si bien représentée dans les écrits de Platon, ont fait naître différentes sectes" (p. 7). M. Dupréel's purpose, as he himself tells us, is to revise this point in the history of philosophy.

The Socrates who is famed for his moral and logical teachings is not the historical Socrates, but the interpretation of the Platonic Socrates made three hundred years after his death by Cicero and other Roman eclectics. The lapse of time had made it impossible to distinguish fact from fancy in the Platonic presentation, so that a literary device on the part of Plato was taken for an historical treatment. Subsequent tradition confirmed this mistaken historicity of the Platonic Socrates, and has so consecrated the teachings of Plato's great master that we have been forced to lose sight of the man in "la légende socratique." M. Dupréel devotes himself to the difficult task of restoring Socrates to the age in which he lived. In his attempt to throw off the weight of tradition, he finds it necessary to relegate Socrates to a position of such inconsequence, that he hastens to apologize to those conservatives who still worship at the altar of the teacher of Plato. This apology is satisfying, for M. Dupréel ushers Socrates off the scene in a way that is at times more cavalier than convincing.

M. Dupréel divides his book into three parts and a conclusion. The first part, *La Doctrine Socratique,* makes up roughly half the book. In it the doctrines generally considered to be characteristic of the Socratic philosophy are attributed to other sources. A careful analysis of the recurrent problems of the earlier Platonic dialogues in connection with an alleged Sophistic work, the *Dissoi Logoi,* and in their interrelations, reveals such inconsistencies in the views referred to Socrates as to make impossible their literal acceptance. Examination of the many *volte-face* made by Socrates

in the *Protagoras, Euthydemus,* and other dialogues, leads M. Dupréel to regard the Platonic Socrates as a device for preserving dramatic unity, and for idealizing the view which Plato favored at the moment. Nor, argues M. Dupréel, does Plato think that his reader will take his treatment of Socrates *au pied de la lettre.* Plato is primarily a literary genius. He is not so much interested in defending any particular *thèse,* or in taking sides in an argument over one of the current controversial *thèmes,* as he is interested in representing the various strands of thought in the intellectual life of the preceding century. This was the great century of the leading Sophists, the true sources of Plato. An examination of the writings of Plato with reference to the *Dissoi Logoi,* and in their own terms, restores the Sophists to their true measure of importance as the intellectual progenitors of Plato. Two conclusions are reached: (1) the Socrates of tradition is a legendary figure; (2) Plato, in the early dialogues at least, is not a systematic philosopher. To this second statement should be added another by way of qualification. M. Dupréel follows Ritter's chronology of the dialogues, which enables him to end his research with the *Theaetetus,* the last dialogue which makes a substantial contribution to our knowledge of Socrates. The reader can not, therefore, refer this statement, that there is no unified system in Plato, to the constructive dialogues that follow the *Theaetetus.*

The second part, *La Figure Socratique,* deals with the teachers and pupils of Socrates, the *dramatis personae* and settings of the dialogues, and the personal appearance of Socrates. This section of the book bears further witness to the fact that the great achievment of Plato was the creation of Socrates. Plato created the hero of the dialogues, he did not draw him after nature. As the teaching of Socrates is a "compilation philososphique," so he himself is a "création littéraire." The Sophists are Plato's intellectual sources; the comic authors are his dramatic sources.

In the third part, *La Postérité Socratique,* M. Dupréel criticizes the point of view that makes all philosophy related to the doctrines of Socrates. In a necessarily summary manner the sources of Xenophon, Aristotle, and the various so-called Socratic Schools, are found to be the theories advanced by the Sophists in the fifth century B. C. Xenophon got his knowledge of Socrates from Plato: he merely consecrated a literary figure already well-known. As a Socratic, Aristotle is discussed in terms of considerable disparagement for speaking authoritatively about Socrates whom he knew only through Plato's portrayal. The weight attached to the statements of Aristotle makes opposition to their authority extremely

hazardous: only the independence and audacity of a Taylor can shake the "roc aristotélicien." Briefly, this section concludes that all the Socratics are second-hand sources for the life and teaching of Socrates. With the exception of Aristophanes, Plato is the only source. But we have already formed an opinion of Plato as Socratic biographer.

The conclusion summarizes the steps in the destruction of the Socratic legend. We are disillusioned in our view of Socrates by a critical study of the *thèmes* in the Platonic dialogues, by the literary aspects of these works, and by a review of the successssors of Socrates and the Socratic Schools. The disillusionment would be more complete if the conclusion on which it is expected to follow were somewhat more inevitable. The evidence, however, fails to support the conclusion to the extent that acceptance of M. Dupréel's position *in toto* becomes difficult. But that is not of prime importance. The value of the book is largely negative; it dispels the enchantment of tradition as a necessary preparation for the recovery of Plato himself. Loosen the hold on men's imagination of the idealized figure of a mythical Socrates, and in this very process the Sophists will regain their proper position of pre-eminence in the Golden Age of Greece. M. Dupréel has made a most important contribution to this work of emancipation from the superstition surrounding the life and teaching of Socrates. His keen historic sense, his vigorous independence of thought, his great intellectual integrity, fit him admirably to be the leader of an insurgent movement in Platonic scholarship which is worthy of serious attention and hearty support.

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Psychology in Theory and Application. HORATIO W. DRESSER. New York: Thomas Y. Crowell Co. 1924. 727 pp.

In this book of some 700 pages, the author purposes to give a survey of the entire field of psychology. The work is intended for the student of the subject and (to quote the description from the wrapper) for the "reader interested in the psychic factor in human nature as a point of view." What the quotation means the reviewer leaves to those wiser than he.

The book is divided into five divisions: Part I, General Psychology; Part II, Psychology of the Hidden Self; Part III, Vocational and Industrial Psychology; Part IV, Social Psychology; and Part V, Social Organization. Part I deals with the material usually found in the "regular" textbooks on psychology, and is largely a compila-

tion from the standard works on the subject. The names of Woodworth, Warren, McDougall, Watson, and William James are mentioned most frequently, and the psychological reader is at once prejudiced in the author's favor, in that, despite the alleged popular character of the book, the author does not begin with the so-called "new" psychology. All too many of the psychological popularizers seem to believe that the unconscious—spelled with a capital U—and the "epoch-making" discoveries of Freud have forever discredited and rendered obsolete the painstaking work of the "academic" psychologists. This book is a welcome exception.

In his first chapters, Dresser gives on the whole a very fair estimate of behaviorism, introspectionism, and the concepts of "drive" and "purpose" as used by Woodworth and McDougall. Many of us would be inclined to agree with the statement that "Behaviorists have more recently exercised the greatest ingenuity in finding verbal substitutes for everything in the faintest way resembling consciousness," though we would be unwilling to go the limit with the author and agree that "purpose brings together in a single principle the implication of the drive and the end which it pursues." The influence of McDougall is seen further in the amount of space allotted to conation, a term which rightly belongs—and should remain—in the older descriptive psychology. Topics such as memory, association, habit, are treated by summarizing what has been said, often much better by authorities. The reviewer fails to see the need for such a term as "mental memory," and still less excuse for such a phrase as "the psychic element of experience" (p. 152). Much of the material in the chapter on Attention and Will strikes the reviewer as mere verbalizing, and much better omitted. Here again, as in preceding chapters, McDougall is the author's guiding spirit. The chapters on Temperament and Character and on Personality are interesting and for the most part well worth reading.

Part II, Psychology of the Hidden Self, if we can overlook the rather occult and mysterious title, is a creditable survey of abnormal psychology. Suggestion, psychotherapy, and psychoanalysis are treated without evidence of propaganda for any one system, and the chapter on psychoanalysis presents Freud's contributions with a sanity that is as infrequent as it is praiseworthy.

Part III, Vocational and Industrial Psychology, is adequate as a summary of the field, though the chapter on Business Success smacks a little too much of certain magazine advertisements on Mind Training, *etc.* The chapter on Mental Tests is carefully done.

Parts IV and V, Social Psychology and Social Organization, com-

plete the volume. The author's treatment on Delinquency and Crime is in line with the best modern authority. Most of the last part of the book properly belongs in a book on sociology rather than in one on psychology; however, the author's ideas on war, pacifism, propaganda, *etc.*, are worth reading.

On the whole, while this book should serve as a useful reference for students of psychology who wish to get the various authoritative statements on a given topic conveniently arranged, it will hardly serve to clarify the ideas of the general reader in regard to what psychology is and does. Dresser's style is often involved and not always clear, and he has an almost too affectionate regard for the terms "psychic" and "purposive" which to many of us have very little meaning.

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Intelligence Testing. R. PINTNER. New York: Henry Holt. 1923. 406 pp.

This is one of the timeliest books from the popular viewpoint that has recently appeared in the general field of psychology, and is one of the soundest and most useful from the viewpoint of the professional psychologist. Its value to an educator is patent at a glance and need not be commented upon further. What the present reviewer would like to emphasize is its very great value for readers in other professions and for any intelligent citizen who wishes to understand the history and values of various socially important applications of tests of what is conveniently called intelligence. The book is lucid throughout and eminently readable. It is divided into three parts comprising twenty chapters, to each of which is appended a most useful list of references. Part I is historical and theoretical and gives considerable attention to the work of that master psychological analyst, Alfred Binet, who laid the foundations of intelligence testing as we know it today. Nearly half of Part I is devoted to a discussion, historical and critical, of the "Concept of General Intelligence."

In Part II Professor Pintner presents a concise description and explanation of the scales that have been developed and used for the measurement of intelligence and also of the group tests that have characterized the latest development in this field. The fourteen chapters of Part III are devoted to a discussion of the results of the application of intelligence tests to various important social problems, such as those connected with the feeble-minded, the superior, the soldier, the school child, the college student, the delinquent, the de-

pendent, the deaf, the blind, the negro, the foreign born and the employee, and the scientific question of the inheritance of intelligence. In his preface the author tells us "that a future edition of such a book as this may well have such chapter headings as 'the emigrant, the voter, the applicant for a marriage license, the candidate for a public office, the civil servant, *et cetera.*' " It is the reading by the general public of just such a book as this that will hasten the realization of such chapter headings.

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The Bhakti Cult in Ancient India: BHAGABAT KUMAR SHASTRI. Calcutta: B. Bannerje & Co. 1922. xxxix + 411 pages.

This volume presents a series of lectures delivered under the auspices of the Calcutta University Post-Graduate Council. Professor Bhagabat Kumar Goswami, who is an adherent of the Sātvata sect of Vishnuism, traces the devotional element in ancient Indian religion and philosophy in its principal manifestations from ritual worship to the highest mystical adoration, and considers its manifold aspects at length. After reviewing, in the earlier chapters, the phases of devotion represented in the various religious and philosophical systems and schools, he discusses the process by which Vishnu became the central and most important figure in the devotion (*bhakti*) cult of the Sātvatas. The remaining chapters (300 pages) develop the Sātvata attitude in detail and deal with the personal aspects of Vishnu and the implications of the mystical attitude, especially in regard to *karma*, the problem of reality and illusion, and the relation of the individual soul to the universal Soul.

The treatment is characterized by familiarity with ancient Hindu lore, a devout attitude, and no little keenness of insight. While the volume has distinct value, considerable previous orientation in this field is necessary for its profitable use by Western readers, most of whom will also find an obstacle in the constant employment of Sanskrit terms (in transliteration) throughout the book, although quotations from Sanskrit texts (which are cited by a singularly inept and misleading series of abbreviations) have in the main been relegated to the footnotes. There is so much good material in the book that it surely deserved to be purged of the incredible multitude of typographical errors and to be provided with a good index.

GEORGE C. O. HAAS.

NEW YORK CITY.

JOURNALS AND NEW BOOKS

MIND. Vol. XXXIII, No. 130. Space and Time: An Essay in the Foundations of Physics (II): *Jaroslav Císař*. Suggestions from Aesthetics for the Metaphysics of Quality (III): *P. Leon*. Recent Criticism of the Idealist Theory of the General Will (I): *J. H. Muirhead*.

THE PHILOSOPHICAL REVIEW. Vol. XXXIII, 2. The Intelligible World, Part II: *Wilbur M. Urban*. The Einstein Theory and a Possible Alternative: *Wm. P. Montague*. Proceedings of the Twenty-Third Annual Meeting of the Eastern Division of the American Philosophical Association.

JOURNAL OF EDUCATIONAL PSYCHOLOGY. Vol. XV, No. 4. Note on the Reliability of a Test: A Reply to Dr. Crum's Criticism: *T. L. Kelley*. A Study of Writing Ability and Its Relation to Other Abilities Based on Repeated Tests During a Period of 20 Months: *A. I. Gates* and *Jessie LaSalle*. Reliability of the Stanford and the Herring Revision of the Binet-Simon Tests: *J. P. Herring*. Comparison of Stanford and Herring Binet Revisions Given to First Grade Children: *G. T. Avery*. Whole and Part Methods in Learning: *Warner Brown*. Sex Differences in Geometric Abilities: *F. C. Touton*. Distributed Practice in Addition: *H. B. Reed*. Two Notes on Statistical Method: *R. Franzen*.

Dotterer, R. H.: Beginner's Logic. New York: Macmillan Co. 1924. 342 pp.

Sihler, Ernest G.: From Augustus to Augustine. Essays and Studies dealing with the Contact and Conflict of Classic Paganism and Christianity. Cambridge University Press. 1923. ix + 335 pp.

NOTES AND NEWS

We wish to make a change in an announcement in a recent issue of this JOURNAL that Professor A. N. Whitehead of the University of London would be in residence at Harvard University during the next academic year. Professor Whitehehad has been appointed for a period of five years.

The following promotions are announced: Dr. Herbert W. Schneider and Dr. Irwin Edman to Assistant Professorships at Columbia University, and Dr. Helen H. Parkhurst to an Assistant Professorship at Barnard College.